

**AMENDMENTS TO THE DRAWINGS:**

Amendments to the drawings are set forth as an attachment to this paper and include both attached replacement sheets of drawings and annotated sheets of drawings showing changes in regard to Figures 1-4.

### REMARKS

Claims 1-16 are currently pending. Minor changes have been made to claim 6 and to page 7 of the written description, which were made to improve readability and accuracy.

The Office Action includes a rejection of claims 1-8 under 35 U.S.C. §102(b) as allegedly being anticipated by the *Okazaki et al. patent* (U.S. Patent 5,966,396).<sup>1</sup> This rejection is respectfully traversed.

As recited in claim 1, the present invention includes a semiconductor device that has rounded corners connected to the substrate, in a lower portion of the mesa structure; a current injection ridge formed *on an upper portion of the mesa structure and protruding from an upper surface of mesa structure*; in a passivation layer formed on the mesa structure and having a contact hole exposing the upper surface of the current injection ridge.

The *Okazaki et al.* patent discloses a mesa structure constituted by a cladding layer 104, a guide layer 105, an active layer 106, another guide layer 107, and a cladding layer 106 which is formed on a contact layer 103. In marked distinction to the present invention, however, this mesa structure is buried in current blocking layers 110.

In this regard, the Office has conveniently attached a marked-up copy of Figures 4A and 4B of the *Okazaki et al.* patent to indicate the Office's position that the rounded corners adjacent to the contact layer 111 in layer 103 represents the rounded corners connected to the substrate. Applicants respectfully submit that this is not appropriate insofar as it is not actually part of the mesa structure as described

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<sup>1</sup> The introduction of the rejection includes mention of claim 1, but the text is directed to claims 1-8.

in the *Okazaki et al.* patent. The mesa structure in the *Okazaki et al.* patent is buried in the current blocking layer 110. Additionally, drawing figures are rarely to scale and should not be relied upon for this form of detail. For instance, Figures 1, 2A, 2B, or 3A, 3B, etc. all include intersections which are square shaped and, because neither intersection is described with reference to the geography, it is respectfully submitted to be a simple draftsman's choice in how they illustrated the intersection.

More fundamentally, the *Okazaki et al.* patent does not anticipate the claims insofar as it does not include a current injection ridge *formed on an upper portion of the mesa structure and protruding from an upper surface of the mesa structure*. In contrast, the cladding layer 108 is in contact with a contact layer 109. Hence, there is nothing analogous to a current injection ridge as recited in claim 1.

The Office's reference to the "0.5 ~ 3.3 nm" is not completely understood, and should the Office continue with the rejection, Applicants respectfully request that the elements in the *Okazaki et al.* patent meeting the recitations of a current injection ridge formed on an upper portion of the mesa structure and protruding from an upper surface of the mesa structure be pointed out.

In light of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §102(b).

The Office Action also includes a rejection of claims 9-16 under 35 U.S.C. §103 as allegedly being unpatentable over the *Okazaki et al.* patent in view of the *Witzigmann et al.* Patent Publication (U.S. Patent Application Publication 2004/0264529) and, in the alternative, over the *Tsukada et al.* patent (U.S. Patent 4,142,160). These rejections are respectfully traversed.

First, it is noted that the *Okazaki et al.* patent does not disclose a current injection ridge, as explained above. For this reason alone, these rejections under 35 U.S.C. §103 should also be withdrawn.

Second, the Office suggests with *Witzigmann et al.* Patent Publication and *Tsukada et al.* patent disclose the use of force distribution ridges. Applicants respectfully disagree. With *Witzigmann et al.* Patent Publication, protective pads 406 are disclosed residing on non-active areas of a junction surface 112 and protrude beyond the ridge of the ridge structure 404. As such, they are not part of the ridge or mesa structure. Accordingly, they cannot and do not meet the recitations of claim 9, whether viewed alone or in combination with the *Okazaki et al.* patent. Specifically, claim 9 recite, *inter alia*, a current injection ridge and force distribution ridges formed on an upper portion of the mesa structure and protruding from an upper surface of the mesa structure. Clearly the pads 104 are not part of a mesa structure and, even if one were to assume that the use of protective pads such as disclosed in the *Witzigmann et al.* Patent Publication could be used in the *Okazaki et al.* device, the hypothetical result would not meet the recitations of independent claim 9.

With respect to the *Tsukada et al.* patent the Office suggests that its disclosure of additional mesa structures to assist in supporting a heat sync or optical waveguide meets the recitations of claim 9, when viewed in combination with the *Okazaki et al.* patent. Applicants respectfully disagree. The cited passage refers to the embodiment shown in Figure 6, which is similar in structure to the *Witzigmann et al.* device in that ancillary and separate from the central mesa structure are additional mesa structures in parallel and opposite to one another relative to the central mesa structure. As such, even if one were to assume it would be obvious to

adopt this structure and the *Okazaki et al.* device, the hypothetical result would not involve force distribution ridges formed on an upper portion of the mesa structure and protruding from the upper surface of the mesa structure, wherein the mesa structure also includes a current injection ridge.

For the foregoing reasons, Applicants respectfully request withdrawal of the rejection under 35 U.S.C. §103.

The dependent claims have not been specifically addressed. While it is likely that additional distinctions can be found in these dependent claims, because the distinction between the independent claims and the applied art are sufficiently clear, a discussion of the dependent claim will not be belabored for sake of brevity.

### **CONCLUSION**

Applicants respectfully request issuance of a Notice of Allowance. Should any residual issues exist, the Examiner is invited to contact the undersigned at the number listed below.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: July 6, 2006

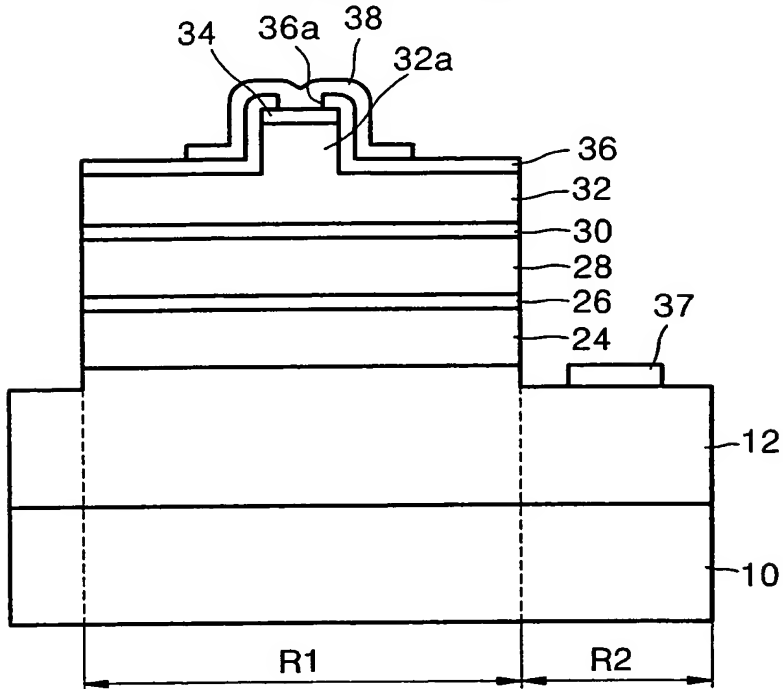
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Attachment: Four sheets of drawings (Figures 1-4), replacement sheets  
and annotated sheets

## Conventional



Conventional

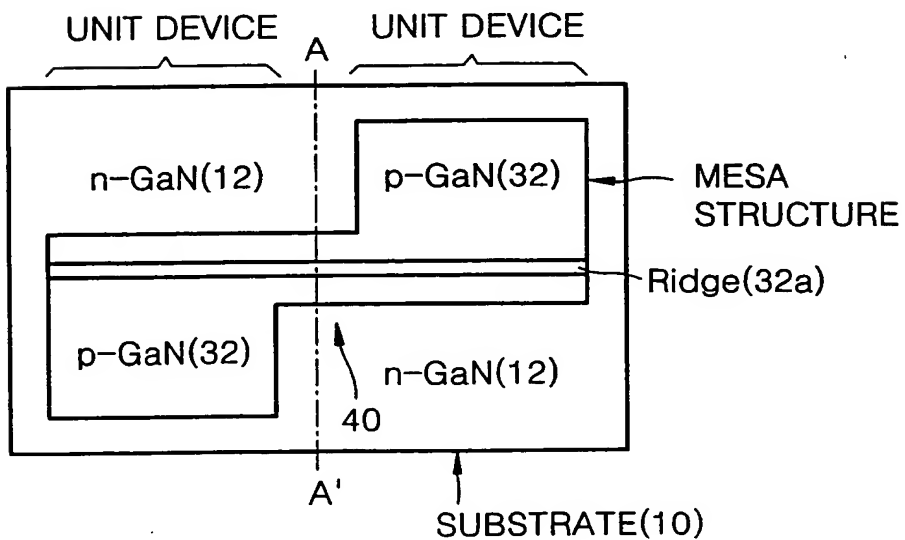
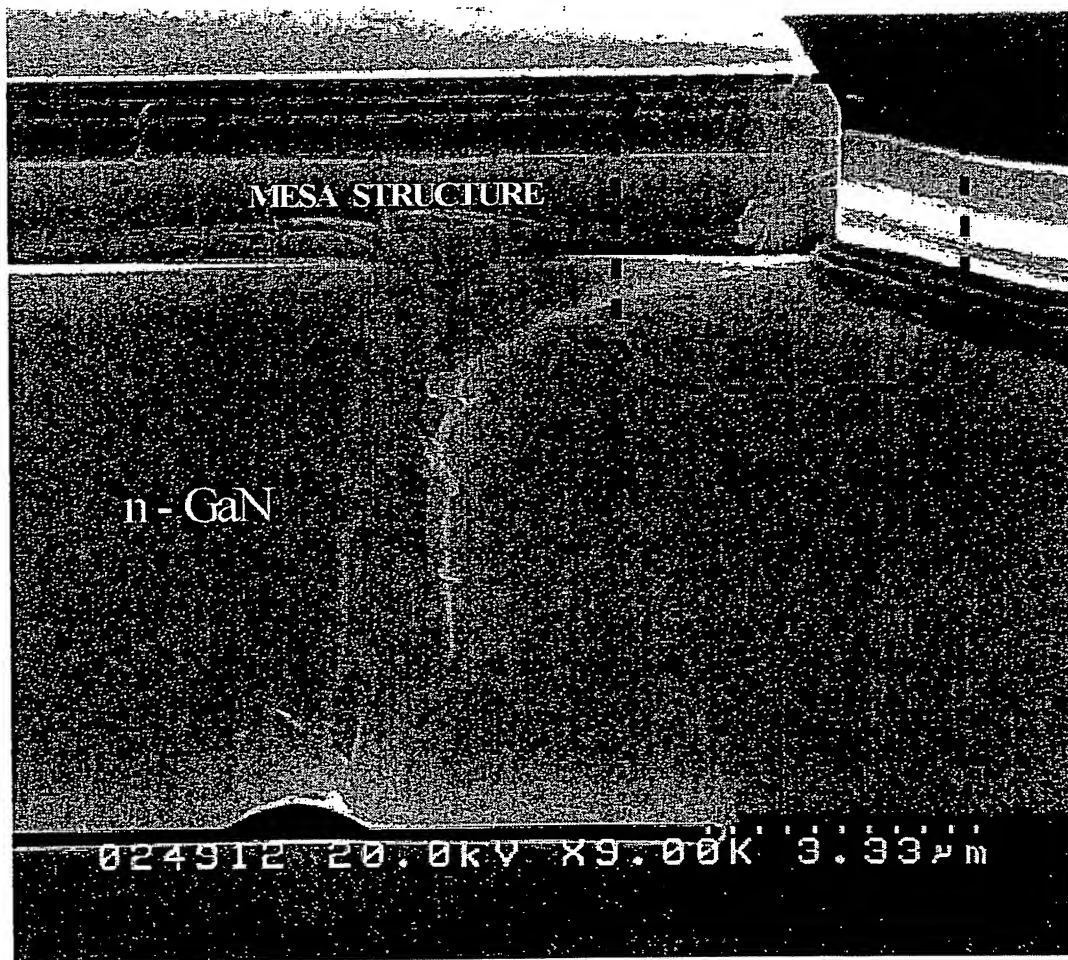


FIG. 3

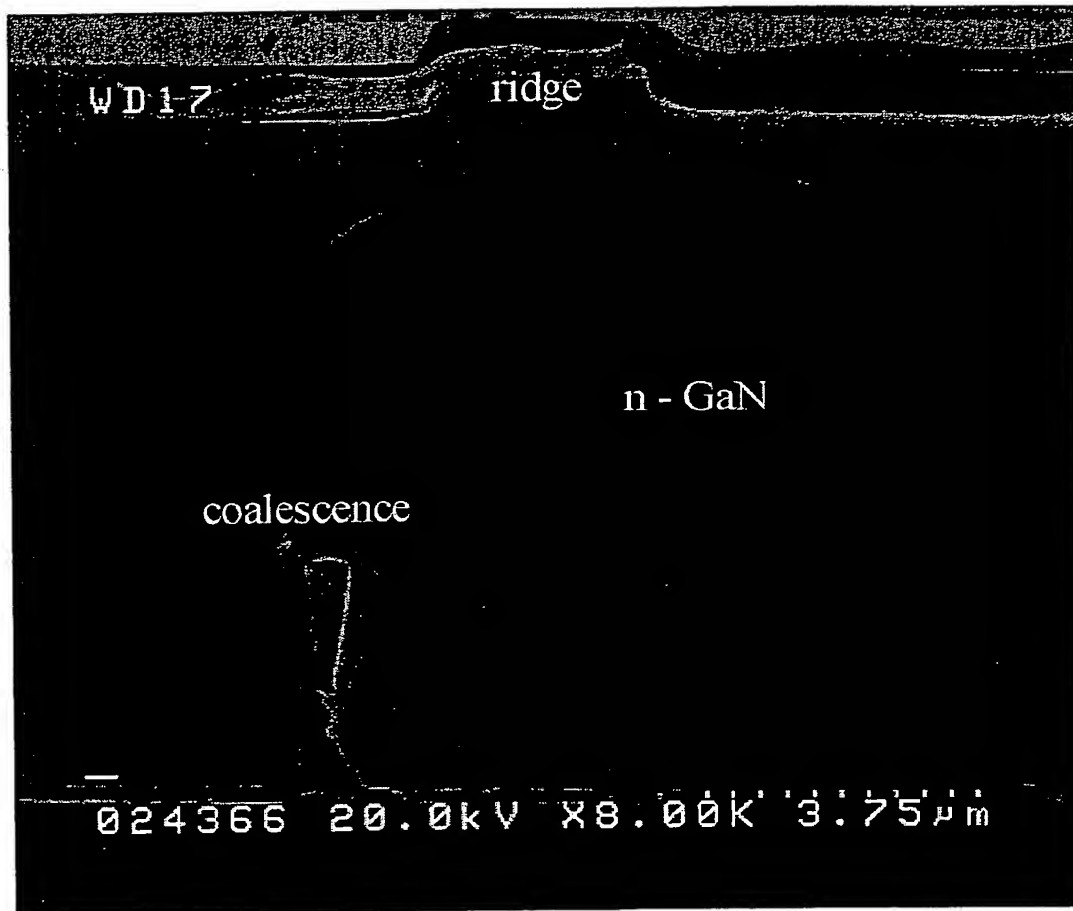
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FIG. 4

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